We claim:

1. An apparatus for radially centering a treatment region of a brachytherapy catheter in a lumen of a body vessel, the catheter having a center line, the apparatus comprising a monofilament wire-form having:

i) proximal and distal ends,

ii) an expanded configuration preformed with multiple lobes arranged in a radially symmetrical staggered sequence along the center line, each lobe extending from the center line to an apex engageable with the lumen of the body vessel, and

iii) a collapsed configuration formable compactly about the center line by drawing apart the wire-form proximal and distal ends.

2. The apparatus of claim 1 wherein the wire-form, when in the expanded configuration, has a length sufficient to extend over the treatment region of the brachytherapy catheter.

3. The apparatus of claim 2 wherein the wire-form proximal and distal ends are attachable to the brachytherapy catheter.

4. The apparatus of claim 1wherein the expanded configuration of the wire-form comprises a distal portion of the wire-form, the distal portion having a length sufficient to extend over the treatment region of the catheter, the wire-form further comprising a proximal portion extending from the distal portion at least to a proximal end of the catheter, the proximal portion being capable of drawing the wire-form proximal end away from the wire-form distal end.

5. The apparatus of claim 1 wherein the lobes are generally disposed in one plane extending through the center line.

6. The apparatus of claim 5 wherein the wire-form is adapted for conjunction about the catheter with at least one additional wire-form adapted for radially centering a treatment region of a catheter in a lumen, such that a combination of the wire-forms has a radially symmetrical sequence of lobes arranged along the center line.

7. The apparatus of claim 6 wherein the radially symmetrical sequence of lobes is staggered along the center line.

8. The apparatus of claim 1 wherein the lobes are generally disposed in at least two radial directions extending through the center line.

9. The apparatus of claim 1 wherein the lobes have shapes that are generally semi-circular or semi-elliptical.

10. The apparatus of claim 1 wherein each lobe has starting and ending segments that are at least partially wrapped around the center line

11. The apparatus of claim 10 wherein the ending segment of one lobe is also the starting segment of an adjacent lobe.

12. The apparatus of claim 10 wherein the starting and ending segments of each lobe are on opposite sides of the center line.

13. A catheter for brachytherapy treatment of a body vessel from within a lumen thereof, the catheter comprising:

an elongate flexible shaft having a distal end and a radiation source located within a distal treatment region;

an actuator element having a distal end and being slidably disposed along the shaft;

a monofilament wire-form mounted about the distal treatment region for radially centering the treatment region within the lumen, the wire-form having:

i) a distal end coupled to the shaft adjacent the distal end thereof,

ii) a proximal end coupled to the distal end of the actuator,

iii) an expanded configuration preformed with multiple lobes arranged in a radially symmetrical staggered sequence along the distal treatment region, each lobe extending from adjacent the distal treatment region to an apex engageable with the lumen of the body vessel, and

iv) a collapsed configuration formable compactly about the shaft by sliding the actuator proximally with respect to the shaft to draw apart the wire-form proximal and distal ends.

14. The catheter of claim 13 wherein the lobes are generally disposed in one plane extending through the distal treatment region.

15. The catheter of claim 13 further comprising at least one additional wire-form adapted for radially centering a treatment region of a catheter in a lumen, such that a conjunction of the wire-forms has a radially symmetrical sequence of lobes arranged along the distal treatment region.

16. The apparatus of claim 15 wherein the radially symmetrical sequence of lobes is staggered along the distal treatment region.

17. The catheter of claim 13 wherein the lobes are generally disposed in at least two radial directions extending through the distal treatment region.

18. The catheter of claim 13 wherein the lobes have shapes that are generally semi-circular or semi-elliptical.

19. The catheter of claim 13 wherein each lobe has starting and ending segments that are at least partially wrapped around the distal treatment region.

20. The catheter of claim 19 wherein the starting segment of one lobe is also the ending segment of an adjacent lobe.

21. The catheter of claim 19 wherein the starting and ending segments of each lobe are on opposite sides of the distal treatment region.

22. The catheter of claim 13 wherein the actuator is a tubular sleeve disposed about the shaft.

23. The catheter of claim 13 wherein the actuator is a filament at least partially disposed within the shaft.